REMARKS

Claim 3 has been amended to correct a minor informality. Claims 13-20 have been added. Support for the subject matter of Claim 13 can be found in the specification at least at page 34, line 15. Support for the subject matter of Claim 14 can be found in the specification at least at page 26, lines 4-9. Support for the subject matter of Claims 15-20 can be found in the specification at least at page 43, line 14 to page 44, line 12and page 45, lines 11-13. No new matter has been added and entry is respectfully requested. After entry of the above amendments, Claims 1-20 are pending.

Applicants hereby confirm the provisional election of the species of formula (2) of Claim 2 in response to the telephone election of species requirement. This provisional election was made with the understanding that, upon allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all of the limitations of an allowable generic claim (37 CFR §1.141).

Contrary to the assertion on Page 3 of the Official Action, however, the provisional election was made with traverse. In particular, Applicants respectfully submit that the search and examination of all of the species identified in the Official Action would not pose an undue burden on the Examiner. Section 803 of the Manual of Patent Examining Procedure states that "[I]f the search and examination of an entire application can be made without serious burden, the examiner must examine it on the merits, even though it includes claims to independent or distinct inventions." In view of the above, applicants respectfully request examination of all currently pending claims.

In responding to the election of species requirement, the applicants take no position regarding whether the claims of the various species identified in the Official Action define distinct inventions.

Claim 1 is directed to a radiation sensitive resin composition comprising a resin polymerized with a living radical polymerization initiator. The resin has a polydispersity {i.e., a ratio of weight average molecular weight (M_w) to number average molecular weight (M_n)} smaller than 1.5. The resin can have an extremely high solubility in a resist solvent. The composition can be used as a positive photoresist material for an ArF excimer laser. By using a radiation sensitive resin composition as set forth in Claim 1, fluctuations in product properties between manufacturing lots can be reduced (See pg. 2 of the specification).

Claims 1, 2, 3 and 5 have been rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent Publication No. 2001/0026901 A1 to Maeda et al. (hereinafter referred to as "Maeda"). This rejection is respectfully traversed.

The Official Action is relying upon the polymer of Examples 18, 24 and 25 of Maeda (page 4 of the Official Action). In particular, the Official Action states that "[i]n Examples 18, 24 and 25 Maeda teaches the polymer has a weight average molecular weight to a number average molecular weight of 1.45, 1.4 and 1.5, respectively". The polymers used in Examples 18, 24 and 25 of Maeda, however, do not have a recurring unit of the formula (1) of present Claim 1. In particular, present Claim 1 recites that " . . . any two of R^2 groups form a divalent alicyclic hydrocarbon group having 4-20 carbon atoms or a derivative thereof in combination with the carbon atom to which the two R^2

groups bond, with the remaining R^2 group being a linear or branched alkyl group having 1-4 carbon atoms or a monovalent alicyclic hydrocarbon group having 4-20 carbon atoms or a derivative thereof". The polymers used in Examples 18, 24 and 25 of Maeda, however, have a recurring unit which meets the definition of formula (1) of Claim 1 only when R^2 is H. The Official Action also asserts that "[t]he polymer that is used in the photoresist composition [of Maeda] is obtained by polymerization with a radical polymerization initiator" (page 4 of the Official Action). Present Claim 1, however, recites that that acid-labile group-containing resin is "polymerized with a living radical polymerization initiator". The Official Action has pointed to no teaching in Maeda of a resin composition as set forth in present Claim 1 wherein the resin is polymerized with a *living* radical polymerization initiator. It should be noted that in Examples 18, 24 and 25 of Maeda polymerization is conducted using azobisisobutyronitrile (AIBN) as a polymerization initiator. In fact, azobisisobutyronitrile is disclosed as a suitable radical polymerization initiator in the specification of Maeda (numbered paragraph [0040] of Maeda). Azobisisobutyronitrile, however, is a conventional radical polymerization initiator and not a *living* radical polymerization initiator. Accordingly, it is respectfully submitted that Claim 1 is not anticipated by Maeda.

Claims 2, 3 and 5 depend either directly or indirectly from Claim 1 and are therefore also not anticipated by Maeda. Reconsideration and withdrawal of this rejection is therefore respectfully requested.

Claims 1-5 and 9-11 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,416,928 to Ohsawa et al. (hereinafter referred

to as "Ohsawa") in view of European Patent Publication No. 1184723 to Nozaki et al. (hereinafter referred to as "Nozaki"). This rejection is respectfully traversed.

The Official Action is relying upon the disclosure in Ohsawa of polymers of formula (2a') (pages 4-5 of the Official Action). In addition, the Official Action is relying upon the alleged disclosure in Nozaki of recurring units of the formula (2) of present Claim 2. As set forth above, however, present Claim 1 recites that the resin is polymerized with a *living* radical polymerization initiator. The Official Action has pointed to no teaching or suggestion in either Ohsawa or Nozaki of a resin composition as set forth in present Claim 1 wherein the resin is polymerized with a *living* radical polymerization initiator. Accordingly, it is respectfully submitted that the Official Action has not established a *prima facie* case of non-obviousness for present Claim 1 and that Claim 1 is therefore patentable over Ohsawa taken with Nozaki.

Claims 2-5 and 9-11 depend either directly or indirectly from Claim 1 and are therefore also patentable over Ohsawa taken with Nozaki for at least the reasons set forth above with respect to Claim 1. Reconsideration and withdrawal of this rejection is therefore respectfully requested.

Claims 1, 6 and 8 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Maeda in view of U.S. Patent No. 4,753,981 to Clark, Jr. (hereinafter referred to as "Clark"). This rejection is respectfully traversed.

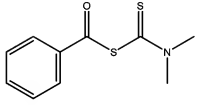
As set forth above, the Official Action has pointed to no teaching in Maeda of a resin composition as set forth in present Claim 1 wherein the resin is polymerized with a *living* radical polymerization initiator. Clark does not remedy this deficiency of Maeda.

In particular, Clark is being relied upon in the Official Action for the alleged disclosure of a living radical polymerization initiator which is a mixture of a transition metal complex, an organic halide and a Lewis acid or an amine as set forth in dependent Claim 6. However, the Official Action has pointed to no teaching or suggestion of a polymerization initiator as set forth in Claim 6 comprising an organic halide. The polymerization initiator described in Clark and relied upon in the Official Action is "p-menthane hydroperoxide activated by ferrous sulfate heptahydrate complexed with the tetrasodium salt of ethylenediamine tetraacetic acid and reduced by sodium formaldehyde sulfoxylate component" (column 4, lines 10-14 of Clark). This initiator does not contain an organic halide. Accordingly, it is respectfully submitted that Claim 6 is patentable over Maeda in view of Clark. Further, it is respectfully submitted that the Official Action has failed to establish that the polymerization initiator described in Clark and relied upon in the Official Action is a *living* radical polymerization initiator as set forth in present Claim 1. Accordingly, it is respectfully submitted that Claim 1 is patentable over Maeda in view of Clark.

Claim 8 depends from Claim 6 and is therefore also patentable over Maeda in view of Clark for at least the reasons set forth above with respect to Claims 1 and 6. Reconsideration and withdrawal of this rejection is therefore respectfully requested.

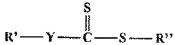
Claims 1, 7 and 12 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Maeda in view of International Patent Publication No. WO 95/10552 to Babu et al. (hereinafter referred to as "Babu"). This rejection is respectfully traversed.

As set forth above, the Official Action has pointed to no teaching in Maeda of a resin composition as set forth in present Claim 1 wherein the resin is polymerized with a *living* radical polymerization initiator. Babu does not remedy the deficiency of Maeda. In particular, Babu is being relied upon in the Official Action for the alleged disclosure of a living radical polymerization initiator which is a compound of formula (8) of dependent Claim 7. In particular, the Official Action is relying upon the disclosure in Babu of the compound S-benzoyl-N,N-dimethyldithiocarbamate. S-benzoyl-N,N-dimethyldithiocarbamate has a structure as set forth below:



s-benzoyl-N,N-dimethyldithiocarbamate

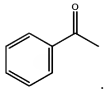
Claim 7 depends from Claim 1 and recites that the living radical polymerization initiator is a compound of the following formula (8),



(8)

wherein R' represents an alkyl group or an aryl group having 1-15 carbon atoms which may contain an ester group, ether group, amino group, or amide group; Y represents a single bond, oxygen atom, nitrogen atom, or sulfur atom; and R" represents an alkyl group or an aryl group having 1-15 carbon atoms which may contain an ester group, ether group, or amino group. In order for the compound S-benzoyl-N,N-

dimethyldithiocarbamate to meet the limitations of Formula (8) of Claim 7, R" would have to be the following moiety:



In Claim 7, however, R" represents an alkyl group or *an aryl group having 1-15 carbon atoms which may contain an ester group, ether group, or amino group.* The moiety set forth above is not an aryl group which contains an ester group, an ether group, or an amino group. Accordingly, it is respectfully submitted that Claim 7 is patentable over Maeda in view of Babu. Further, it is respectfully submitted that the Official Action has failed to establish that the polymerization initiator described in Babu and relied upon in the Official Action is a living radical polymerization initiator as set forth in present Claim 1. Accordingly, it is respectfully submitted that Claim 1 is patentable over Maeda in view of Babu.

Claim 12 depends from Claim 7 and is therefore also patentable over Maeda in view of Babu for at least the reasons set forth above with respect to Claims 1 and 7. Reconsideration and withdrawal of this rejection is therefore respectfully requested.

Claims 13-20 have been added. Claims 13-20 depend either directly or indirectly from Claim 1 and are therefore also patentable over the cited references for at least the reasons set forth above with respect to Claim 1.

There is also objective evidence of non-obviousness which further distinguishes the claimed invention from the cited references. In particular, the specification contains

data comparing resist compositions as set forth in the claims comprising a resin polymerized with a living radical polymerization initiator (i.e., Examples 1-26) to a resist composition comprising a resin polymerized with AIBN (i.e., azobisisobutyronitrile) which is not a *living* radical polymerization initiator (Comparative Example 1). As can be clearly seen from the data which presented in Table 4 on page 77 of the specification, the resist compositions as set forth in the claims had significantly lower line edge roughness (LER) values compared to the resist composition of the comparative example. It should be noted that azobisisobutyronitrile (AIBN) is disclosed in the Maeda reference as a suitable radical polymerization initiator (numbered paragraph [0040] of Maeda). In fact, azobisisobutyronitrile is used as a radical polymerization initiator in the Examples of Maeda, including Examples 18, 24 and 25 which were cited in the Official Action.

In view of the evidence of non-obviousness set forth above, it is respectfully submitted that the subject matter of the claims can be further distinguished from the references of record.

CONCLUSION

In view of the above amendments and remarks, Applicants respectfully request a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

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